

Notice of Allowability

Application No.

10/644,953

Examiner

Henry S. Hu

Applicant(s)

ARAKI ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Pre-Appeal Brief of October 20, 2006.
2. ☒ The allowed claim(s) is/are 1-3,5 and 7-10.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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1. This application is in condition for allowance except for the presence of **Claims 11-25**, which is **non-elected without traverse** as filed on November 30, 2005 (see page 1 of Remarks). **Two non-elected species Claims 3 and 8 are now rejoined** with Claims 1-2, 5, 7 and 9-10 by Examiner based on the fact that parent Claim 1 along with its elected species Claims 2 and 5 are allowed with factor of “a” being 1. Accordingly, **other two non-elected species Claims 4 and 6 as well as non-elected Claims 11-25 have been cancelled.** An action follows.

EXAMINER’S AMENDMENT

2. An examiner’s amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The examiner has cancelled the above-mentioned **Claims 11-25**, which are **non-elected without traverse** by Attorney **Abraham J. Rosner** (registration # 33,276) on November 30, 2005. With the authorization of Attorney Rosner from two telephone interviews on December 18 and 22, 2006, the Examiner has thereby cancelled other non-elected species **Claims 4 and 6**, amended parent **Claim 9** with correct formula number and removed the factor of “a being 0” from three parent **Claims 1, 3 and 9** as follows:

CLAIMS

Claims 4, 6 and 11-25 please cancel Claims 4, 6 and 11-25

Claim 1 at the end please replace the phrase of “a is 0 or 1” with a phrase of “a is 1”

Claim 3 at the end please replace the phrase of “a is 0 or 1” with a phrase of “a is 1”

Claim 9 at lines 19-20 of original page 99 please replace the phrase of “a is 0 or 1”
with a phrase of “a is 1”

Claim 9 at line 22 of original page 99 please replace chemical formula’s number
“(1a)” with a number of “(1)”

DETAILED ACTION

3. Applicants’ **Pre-Appeal Brief Request for Review** filed on October 20, 2006 was received. **No claim was amended, cancelled or added.** With above Examiner’s amendment, all non-elected **Claims 4, 6 and 11-25** are cancelled. **Claims 1-3, 5 and 7-10 are now pending** with only one independent claim (**Claim 1**). An action follows.

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4. Claim rejections in previous Final Office Action filed on June 20, 2006 are now removed for the reasons given in paragraphs 5-11 thereafter.

Allowable Subject Matter

5. Claims 1-3, 5 and 7-10 are allowed.

6. The following is an examiner's statement of reasons for allowance: The above Claims 1-3, 5 and 7-10 are allowed over the closest references:

7. The limitation of parent **Claim 1** in present invention relates to ***a fluorine-containing ethylenic monomer having hydroxyl group represented by the formula (1a):***

$CX^1X^2=CX^3-(Rf^3)_a-C(Rf^1)(Rf^2)-OH$ wherein X^1 and X^2 are the same or different and each is H or F; X^3 is H, F, Cl or CF_3 (***at least one of X^1 , X^2 and X^3 is H and X^1 , X^2 and X^3 are not H at the same time***); Rf^1 and Rf^2 are the same or different and each is a perfluoroalkyl group having 1 to 20 carbon atoms; Rf^3 is a fluorine-containing alkylene group having 1 to 40 carbon atoms or a fluorine-containing alkylene group having ether bond which has 1 to 100 carbon atoms and the sum of carbon atom and oxygen atom of two or more; ***a is 1 only***. The scope of ***Claims 1, 2, 3, 5 and 7-10*** is related to monomers with ***a = 1 only***. Other independent claims are Claims 2, 3, 5 and 9. See other limitations of dependent Claims 7, 8 and 10.

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8. Applicants have claimed in five independent claims including **Claims 1, 3 and 9** (now with the factor of “a” being 1 only) as well as **Claims 2 and 5** (still with the factor of “a” being 1 after conversion) an unexpected way of producing **a fluorinated monomer** with a general formula (1a) as **$CX^1X^2=CX^3-(Rf^3)_a-C(Rf^1)(Rf^2)-OH$** , a formula (2) or (3) (which is specified from formula (1a)), and a formula (1) (which is broader than formula (1a)) respectively as well as their homo- and/or co-polymers obtained therefrom.

The once-amended chemical structure of such a hydroxyl-containing fluorinated monomer carries **a combination of factors** as: (A) at least one of X^1 , X^2 and X^3 is H, while X^1 , X^2 and X^3 are not H at the same time (Claim 1), (B) Rf^3 is a bivalent fluorine-containing alkylene or oxyalkylene group, (C) a is now 1 only, and (D) Rf^1 and Rf^2 are the same or different perfluoroalkyl group.

Claims 1-2, 5, 7 and 9-10 have been examined so far since Species # (2) for $a = 1$; $X^1 = X^2 = H$, $X^3 = F$ is elected by Applicants as filed on 11-30-2005. Non-elected **species** Claims 4 and 6 are thereby cancelled since **a restriction requirement is found to be necessary**. For instance, when with the factor of “a” being 0, such obtained monomer is related to a different type such as vinyl ether, which is patentably quite distinct from monomer with the factor of “a” being 1. However, other species Claims 3 and 8 are rejoined with elected Group I since the factor of “a” is 1. When a is 1, the three-component structure with Rf to be useful as bivalent groups in the monomers of elected parent Claims 1, 2, 5 and 9 is found to be an allowable subject matter.

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9. The one and only one 103(a) rejection is relying the combination of two reference combinations including Adelman/Araki and Inomata/Araki. However, each cannot stand as follows:

As discussed earlier, each of Adelman or Inomata only discloses at least two monomers including CH₂=CH-CH₂-C(CF₃)₂-OH and CH₂=CH-(CH₂)_n-C(CF₃)₂-OH, **which are structurally and chemically at least somewhat different from unsaturated moieties from the claimed formula (1a) for Claim 1, (2) for Claim 2, (3) for Claim 3, (5) for Claim 5 and (1) for Claim 9.**

Secondary reference **Araki** cannot fix the deficiency of Adelman or Inomata as follows:

Firstly, Araki only discloses monomers with X² end group in his formula being only a primary alcohol or an epoxide-containing moiety (see page 9 bottom of Remarks; also see formula in Araki's abstract). No tertiary fluoroalcohol is disclosed or suggested.

Secondly, Applicants argue that Araki cannot teach related monomers having a fluorine-containing alkaline group at the 3-position corresponding to Rf³ of present Claim 1.

Thirdly, monomers from Adelman "148" and Inomata "988" carrying CH₂=CH-CH₂- and CH₂=CH-(CH₂)_n- moiety are used to make copolymer so as to enhance both compatibility (with acrylonitrile due to fluorine content) and dyeability (from the presence of fluoroalcohol). The key point is that **all references in combination or alone cannot recognize the advantage by**

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using the combination of both CH₂=CF-Rf- moiety and the claimed tertiary fluoroalcohol.

Such a polymerizable moiety is thereby not functionally equivalent and interchangeable

accordingly. A hindsight reconstruction may be used. In summary, the motivation to link is thereby missing for 103 rejection (see page 2 of Pre-Appeal Brief Request).

10. Additionally, the present invention has already shown unexpected results in examples along with some control examples for making such a hydroxyl-containing fluorinated monomer along with three-component structure as specified in five formula (1a), (2), (3), (5) and (1) (see pages 78-94 for **examples 1-6 with control and Table 1**). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention. The Examiner confirms that two A-references are cited on the search report for Applicants' two other articles including **EP 1,375,598 A1 (JP 2001064770) and EP 1,498,459 A1 (JP 2002123785)**.

11. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

US Patent No. 3,414,549 to Schaeffen only discloses the preparation of monomer of **CH₂=CH-C(CF₃)₂-OH** (column 3, line 24-46; column 8, line 32-39) as well as its linear copolymers. **Such a monomer is clearly within the factors of a = 0, and X¹ = X² = X³ = H.** Therefore, it is outside the scope with the factor of "a" being 1.

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JP Patent No. 2002-90996 A to Asahi Glass Assignee only discloses the preparation of perfluorinated monomers such as $\text{CH}_2=\text{CH}-(\text{CH}_2)_n-\text{C}(\text{CF}_3)_2-\text{OH}$ (column 4, line 6) and $\text{CF}_2=\text{CF}-(\text{CF}_3)_m-\text{C}(\text{CF}_3)_2-\text{OH}$ (column 5, line 18) as well as its copolymers. **Such a monomer is only within the factors of $a = 1$, and either $\text{X}^1 = \text{X}^2 = \text{X}^3 = \text{H}$ or $\text{X}^1 = \text{X}^2 = \text{X}^3 = \text{F}$.** Therefore, **they are structurally and chemically outside the scope of five formula (1a), (2), (3), (5) and (1).** Additionally, it carries a publication date of **March 27, 2002**, which is later than the priority date February 23, 2001 of instant application.

US Patent No. 3,391,119 to Anderson only discloses the preparation of perfluorinated monomers such as $\text{CF}_2=\text{CF}-(\text{CF}_3)_2-\text{C}(=\text{O})-\text{CF}_3$ (column 7, line 1-46; column 1, line 25-32) as well as its copolymers. **Such a monomer is only within the factors of $a = 1$, and $\text{X}^1 = \text{X}^2 = \text{X}^3 = \text{F}$ as well as without the required perfluorinated tertiary alcohol group $(-\text{C}(\text{CF}_3)_2-\text{OH})$.**

US Patent No. 6,610,456 B2 to Allen et al. only discloses that in the course of making fluorinated **copolymers** to be useful for lithographic photoresist, monomeric moieties such as $\text{CH}_2=\text{CH}-\text{Y}-$ and $\text{CH}_2=\text{CF}-\text{Y}-$ are functionally equivalent and inter-exchangeable; while its **linking group Y is starting with a carbon atom and it can be either fluorinated or non-fluorinated** (see column 3, line 1-49; particularly see R_1 can be H or F, and R_2 can be alkyl or fluorinated alkyl group). By doing so, copolymers with both types of monomeric moieties are particularly useful for 157 nm resists (column 1, line 38-49; column 2, line 24-33). However, **the comonomer is styrene-type monomer** (column 6, line 20-35). Additionally, it carries a

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US filing date of **February 26, 2001**, which is later than the priority date February 23, 2001 of instant application.

12. The key issue on making a fluorinated monomer having hydroxyl along with three-component structure as specified in five formula (1a), (2), (3), (5) and (1), cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

13. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the five independent **Claims 1, 2, 3, 5 and 9** are allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining three pending dependent **Claims 7, 8 and 10** are passed to issue.

14. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

Patent Examiner, art unit 1713, USPTO

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DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700